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ELECTRONIC STILL CAMERA AND ITS CONTROL METHOD
[Denshi suchiru kamera oyobi sono seigyo hoho]

Hitoshi Ueno et al

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Inventor : Hitoshi Ueno et al

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[Title of Invention] Electronic still camera and its control method

[Summary]

[Purpose] To record only the required image data in the recording medium.

[Constitution] The object is photographed by the camera head 10 and the image data displaying the photographed object is stored in the frame memory 28 of the control device 28. The image data of several frames can be stored in the frame memory. When the limited mode is set, the frame memory 28 is full, photographing is stopped. When the endless mode is set, the image data stored the longest in the frame memory 28 is deleted, the new image data is stored in the frame memory 28 where the deleted image data was stored. When the image data of frame memory 28 is inserted and read out, the condensed images of several frames are displayed in the monitor display device 44 of the computer device 40. The desired image is selected from the displayed condensed images. The image data showing the selected image is provided to the computer device 40 read from the frame memory 28 and recorded in a recording medium of a recording device 45.

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[1] Numbers in the margin indicate pagination in the foreign text.

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[Scope of Patent Claims]

[Claim 1] An electronic still camera is provided with a photographing means for photographing the object and the image data displaying the object is outputted, a memory means for storing the image data of several frames that are outputted from the photographing means and stored them in sequence in the memory region, a mode setting means for setting the mode into the endless photographing mode or the limited photographing mode. When the limited mode is set, the frame memory is full, photographing is stopped. When the endless mode is set, the image data stored the longest in the frame memory is deleted, the new image data is stored in the memory where the deleted image data was stored. When the image data of frame memory is inserted and read out according to the provided recording command, a record control means record the image data in a recording medium.

[Claim 2] The electronic still camera of Claim 1 is provided with a display means for displaying the object displayed in the image data stored in the above memory means and a selection means for selecting the object displayed in the display means. The above recording control means read the image data showing the object selected by the above selection means from the above described memory means and record the data in the recording medium.

[Claim 3] The electronic still camera of Claim 2 is provided with a condensed means where a condensed image is obtained, this condensed image displays the image data stored in the above memory means and the above display means shows the condensed image condensed by the above condensing means.

[Claim 4] For changing the amount of exposure for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a brightness setting means for setting the brightness in at least one region of the object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 5] The electronic still camera cited in Claim 4 is characterized in that the change of the exposure amount in the above photographing means is performed by changing the aperture or the shutter speed.

[Claim 6] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 7] For changing the zoom amount for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a display means for displaying the photographed object which are displayed in the image data stored in the above memory means, a selection means for selecting the object having the desired size from the photographed object displayed in the above described display means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 8] The electronic still camera stated in Claim 7 is provided with a condensing means where a condensed image is obtained from the image displayed in the image data stored in the above described memory means, the above display means shows the condensed image that was condensed by the above described condensed means.

[Claim 9] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a region dividing means for dividing the region into several regions of brightness on the photographed object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 10] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a region dividing means for dividing the region into several regions of brightness on the photographed object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

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[Claim 11] With the control method of the electronic still camera, when the endless photographing mode is set, the object is photographed in response to the photographing command, the image data showing the photographed object is obtained. The obtained image data is stored in the memory region that has been set in sequence, when there is no memory left, the image data that has been stored the longest is deleted, the new image data is stored. When the limited photographing mode is set, the object is photographed in response to the photographing command, the image data showing the photographed object is obtained, the image data obtained is stored in the memory region that has been set in sequence, the memory region is full, the photographing of the object is stopped, the image data that is stored is recorded in the recording medium in response to the recording command.

[Claim 12] The control method of the electronic still camera of Claim 11 is characterized in that the photographed object displayed by the image data that is stored is displayed, this displayed photographed object is selected and the image data showing the photographed object is stored in the recording medium.

[Claim 13] The control method of the electronic still camera of Claim 12 is characterized in that the condensed image of the photograph image displayed by the image data that is stored is produced, the condensed image that is produced is then displayed.

[Claim 14] For changing the amount of exposure for each frame of photographing and to continue photographing the object in several frames, the control method of the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a brightness setting means for setting the brightness in at least one region of the object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 15] The electronic still camera cited in Claim 4 is characterized in that the change of the exposure amount in the above photographing means is performed by changing the aperture or the shutter speed.

[Claim 16] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 17] For changing the zoom amount for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a display means for displaying the photographed object which are displayed in the image data stored in the above memory means, a selection means for selecting the object having the desired size from the photographed object displayed in the above described display means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 18] The control method of the electronic still camera of Claim 17 is characterized in that the condensed image of the photograph image displayed by the image data that is stored is produced, the condensed image that is produced is then displayed.

[Claim 19] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a region dividing means for dividing the region into several regions of brightness on the photographed object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Claim 20] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a region dividing means for dividing the region into several regions of brightness on the photographed object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[Detailed explanation of invention]

[0001]

[Industrial field of use] The invention pertains to an electronic still camera and its control method where the image data showing the photographed object is recorded in a recording medium.

[0002]

[Technology Background] A digital electronic still camera is realized by recording the image data showing the photographed object in a memory card. The digital electronic still camera has the characteristic in which the image data can be processed as digital data easily.

[0003] The recording capacity of the digital electronic still camera depends on the capacity of the memory card installed in the camera. When the recording has reached a certain capacity of the memory card, the memory card cannot be replaced.

[0004] Also, the image data obtained from photographing an object with the digital electronic still camera is stored in a memory card. Therefore, the unwanted image data can be deleted from the image data recorded in the memory card, first, the image memory is read from the memory card, the photographed image displayed by the read out image data is displayed in the display device. When the display image is viewed, the image data is judged if it is wanted, only the unwanted image data is deleted.

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[0005] In addition, by photographing continuously, when the photographed image showing the photographed object is obtained in several frames by changing the brightness, several frames of this photographed image are displayed, any of these photographed images can be selected from the displayed photographed images by the photographer. The selected photographed images are produced into prints.

[0006] When any of the frames are selected from the several frames of photographed images, the string of photographed images are displayed, any frames can be selected from the displayed photographed images. Automatic selection of the frame is not possible so selection of the frames becomes a problem.

[0007]

[Disclosure of the invention] The purpose of the invention is to record only the required image data in the recording medium.

[0008] Also, the purpose of the invention is to select the required photographed image from the several photographed images and record them in a recording medium.

[0009] The electronic still camera of the 1st invention is provided with a photographing means for photographing an object and the image data displaying the object is outputted, a memory means for storing the image data of several frames that are outputted from the photographing means and stored them in sequence in the memory region, a mode setting means for setting the mode into the endless photographing mode or the limited photographing mode. When the limited mode is set, the frame memory is full, photographing is stopped. When the endless mode is set, the image data stored the longest in the frame memory is deleted, the new image data is stored in the memory where the deleted image data was stored. When the image data of frame memory is inserted and read out according to the provided recording command, a record control means record the image data in a recording medium.

[0010] With the control method of the electronic still camera of the 1st invention, when the endless photographing mode is set, the object is photographed in response to the photographing command, the image data showing the photographed object is obtained. The obtained image data is stored in the memory region that has been set in sequence, when there is no memory left, the image data that has been stored the longest is deleted, the new image data is stored. When the limited photographing mode is set, the object is photographed in response to the photographing command, the image data showing the photographed object is obtained, the image data obtained is stored in the memory region that has been set in sequence, the memory region is full, the photographing of the object is stopped, the image data that is stored is recorded in the recording medium in response to the recording command.

[0011] When the endless photographing mode is set according to the 1st invention, the object is photographed in response to the photographing command, the image data showing the photographed object is obtained. The obtained image data is stored in the memory region that has been set in sequence, when there is no memory left, the image data that has been stored the longest is deleted, the new image data is stored. When the endless photographing mode is set, when there is no space in the memory region, photographing is continued, the image data is recorded in the recording medium in response to the recording command.

[0012] Also, when the limited photographing mode is set, the object is photographed in response to the photographing command, the image data showing the photographed object is obtained. The obtained image data is stored in the memory region that has been set in sequence, when there is no memory left, the photographing is stopped, the image data is first recorded in a recording medium before the image data is removed, the vital image data can be prevented from deletion.

[0013] The photographed object displayed by the image data that is stored is displayed, this displayed photographed object is selected and the image data showing the photographed object is stored in the recording medium.

[0014] Since the photographed image displayed by the image data obtained by photographing can be verified, the vital image and the unwanted image data can be separated, only the vital image data can be recorded in the recording medium.

[0015] The condensed image of the photograph image displayed by the image data that is stored is produced, the condensed image that is produced is then displayed.

[0016] Since the displayed images are condensed, several images can be displayed on one screen. Therefore, the vital photographed images and the unwanted photographed images can be separated easily.

[0017] For changing the amount of exposure for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 2nd invention is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a brightness setting means for setting the brightness in at least one region of the object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

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[0018] For changing the amount of exposure for each frame of photographing and to continue photographing the object in several frames, the control method of the electronic still camera of the 2nd invention is set with brightness in at least one part of the photographed image, the image data showing the photographed image is obtained, this image data of several frames of photographed images are stored. The photographed image have a brightness close to the brightness set by the brightness setting means, this is selected by the operator and recorded in a recording medium. The photographed image with a desired brightness is obtained.

[0019] According to the 2nd invention, the brightness in the photographed image is set by the operator. It is preferred that the brightness is set in one region of the photographed image or it can be over the entire image. The object is photographed by changing the exposure for each frame of photographing. The image data showing the photographed object is obtained. Among the photographed images displayed by these image data, the photographed images having the region where the brightness is close that brightness set by the operator is selected and recorded in a recording medium. The photographer can obtain the photographed image with the desired brightness according to the 2nd invention.

[0020] The change of the exposure amount in the above photographing means is performed by changing the aperture or the shutter speed.

[0021] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 3rd invention is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[0022] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 3rd invention is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[0023] According to the 3rd invention, a photograph is taken by changing the position of the focusing lens for each frame and several frames. The image data showing the object obtained from photographing is obtained. The focused photographed images displayed by these image data are selected and recorded in a recording medium. A focused image is obtained according to the focusing of the 3rd invention.

[0024] For changing the zoom amount for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 4th invention is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a display means for displaying the photographed object which are displayed in the image data stored in the above memory means, a selection means for selecting the object having the desired size from the photographed object displayed in the above described display means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[0025] For changing the zoom amount for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 4th invention is provided with a photographing means installed with the zoom lens. The image data showing the object obtained from photographing is obtained. The photographed images having the desired size displayed by these image data are selected and recorded in a recording medium.

[0026] For changing the zoom amount of the zoom lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 4th invention obtained the image data showing the object that is photographed.

The photographed images having the desired size displayed by these image data are selected and recorded in a recording medium. The photographed images having the desired size is obtained according to the 4th invention.

[0027] A condensed image is obtained from the image displayed in the image data stored in the above described memory means, the above display means shows the condensed image that was condensed by the above described condensed means.

[0028] Since the display image is condensed, several images can be displayed on one image, the desired images can be separated comparatively easily.

[0029] For changing the aperture value for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 5th invention is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a region dividing means for dividing the region into several regions of brightness on the photographed object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording control means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means to a recording medium.

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[0030] The control method of the electronic still camera of the 5th invention uses a photographing means that is provided with an aperture. The exposure amount is changed by changing the aperture value of the above aperture, several frames of objects can be photographed, the image data showing the photographed images are obtained and the image data are stored. The photographed images displayed by the image data are divided into several regions according to their brightness. The region made up of the photographed images is determined by combining the regions of the photographed images according to their brightness, the photographed images with brightness can be determined, the image data in the determined region are recorded in the recording medium.

[0031] According to the 5th invention, the brightness use in the photographed images are set by the photographer. The exposure amount is changed for each frame or several frames of objects that are photographed, the image data showing the photographed images are obtained and the image data are stored. The photographed images displayed by the image data are divided into several regions according to their brightness. The region made up of the photographed images is determined by combining the regions of the photographed images according to their brightness, the photographed images with brightness can be determined, the image data in the determined region are recorded in the recording medium.

[0032] The regions are divided according to the brightness, the photographed images are made up of regions having brightness set by the photographer, thus, photographed images having the desired brightness can be obtained for the case when the brightness is very for each region.

[0033] For changing the position of the focusing lens for each frame of photographing and to continue photographing the object in several frames, the electronic still camera of the 6th invention is provided with a photographing means for outputting the image data displaying the photographed object, a memory means for storing several frames of image data outputted from the above photographing means, a region dividing means for dividing the region into several regions of brightness on the photographed object, an object determination means for determining the object to be photographed with a region having the brightness close to the brightness set by the brightness setting means and a recording means for recording and reading the image data from the above memory means showing the object determined by the photographing determination means.

[0034] The control method of the electronic still camera of the 6th invention perform the photographing continuously for several frames of the objects by changing the position of the focusing lens, the image data showing the photographed images are obtained and the image data are stored. The photographed images displayed by the image data are divided into the focused region and the non-focused region. The region made up of the photographed images is determined by combining these regions, the image data in the determined region are recorded in the recording medium.

[0035] The control method of the electronic still camera of the 6th invention perform the photographing continuously for several frames of the objects by changing the position of the focusing lens, the image data showing the photographed images are obtained and the image data are stored. The photographed images displayed by the image data are divided into the focused region and the non-focused region. The region made up of the photographed images is determined by combining these regions, the image data in the determined region are recorded in the recording medium.

[0036] The regions are divided into the focused region and non-focused region. Since the photographed images are made from the focused region, focusing is performed for all the regions in the photographed images.

[0037]

[Implementation examples of the invention]

(1) The 1st implementation example

Since figure 1 shows the implementation example of the invention, the block diagram shows the electronic configuration of the electronic still camera system.

[0038] A computer device 40 is contained in the electronic still camera system, for example, it is used for controlling the photographing of the picture and the display of the photographed picture and the transport of the image data showing the photographed picture. The command outputted from the computer device 40 is supplied to the control device 20 bus connected to the computer 40. The photographing control signal is provided based on the command from the computer device 40 in the camera head 10 from the control device 20, the photographing of the object is performed.

[0039] The analog image signal showing the picture to be photographed and the object to the photographed are provided to the control device 20 from camera head 10 and it is stored and converted into digital image data. The digital image data stored in the control device 20 is sent to the computer device 40 from the control device 20 according to the transfer command from the computer device 40.

[0040] Contained in the camera head 10 is the focus lens 11 for focusing, the zoom lens 12 for zooming and the aperture 13 for exposure control. The focus lens 11, the zoom lens 12 and the aperture 13 are controlled by the focus motor 15, the zoom motor 12 and the aperture motor 17 driven based on the control data provided from the control device 20 via the connectors 32 and 19.

[0041] The photographed image from the focus lens 11 and zoom lens 12 are focused on the photo receiving surface of the CCD14. The analog RGB point sequence signal showing the photographed image is outputted from the CCD14 and provided to the process circuit 23 of the control device 20 via the connectors 18 and 31.

[0042] The analog/digital conversion circuit 21 and color separation circuit 22 are contained in the process circuit 23. The analog RGB point sequence signal provided from the camera head 10 is converted into digital image data in the analog/digital conversion circuit 21 and provided to the color separation circuit 22. The data are separated and outputted into separate image data of R, G and B in the color separation circuit 22.

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[0043] The image data of R, G and B are provided to the respective look up Tables 26R, 26G and 26B of the memory circuit 26. Since the look up Tables 26R, 26G and 26B store the data for gamma correcting the inputted R, G and B image data, by providing the image data of R, G and B to the look up Tables 26R, 26G and 26B, gamma correction is performed.

[0044] The R, G and B image data from the memory circuit 26 that stored the look up Tables 26R, 26G and 26B are provided to the frame memory 28. The frame memory 28 is the memory that can store several frames of image data. In this example, the frame memory 28 can store 8 frame of image data. In the frame memory 28, frame memory 28R stores the R image data, frame memory 28G stores the G image data and frame memory 28B stores the B image data. One frame image data is stored in these frame memory 28R, 28G and 28B.

[0045] The CPU29 contained in the control device 20 read the image data stored in the frame memory 28 and read the insertion according to the command provided from the bus connected computer device 40, the photographing control is performed in the camera head 10.

[0046] Computer device 40 generalized all the action by the CPU42. Input device 46 is contained in the computer device 40. The command in the input device 46 is provided to CPU42. A keyboard and a mouse are contained in the input device 46. A recording device 45 for recording in a recording medium is installed outside the CPU42, for example, a photomagnetic disk is used as the recording medium.

[0047] Also, a monitor display device 44 is connected to the computer device 40 for displaying the photographed picture displaying the image data. This monitor display device 44 is driven by the driver 43 and controlled by CPU42. The computer device 40 is bus connected to the control device 20 by the SCSI controller 41.

[0048] Figure 2 shows an example of the display image (this image is called the basic image) of the monitor 44 connected to the computer device 40.

[0049] The upper half region of the display screen of the monitor display device 44 becomes the computer - image display region 60. 8 display regions PR1 - PR8 are set in the computer - screen display region 60. A condensed image of the photographed picture displayed by the image data stored in the frame memory contained in the control device 20 is displayed in these display regions PR1 - PR8.

[0050] The upper half region of the display screen of the monitor display device 44 becomes the set display region 61. The set display region 61 shows the photographing conditions of the camera head 10 set by the input device 46.

[0051] The total shut aperture value display part 64 showing the aperture value for the opening of the aperture 13, the release aperture value display part 63 showing the aperture value when the aperture 13 is released and the automatic expose display part 62 showing the setting of the automatic exposure are contained in the set display region 61. The set aperture value display part 65 showing the aperture value that is set, the aperture modification display part 66 for modifying the aperture value, the focusing position display part 67 showing the focusing position that is set, the focusing position modification display part 68 for modifying the focusing position, the zoom amount display part 69 showing the zoom amount that was set and the zoom amount modification display part 70 for modifying the zoom amount are contained in the set display region 61.

[0052] As described above (the 2nd implementation example), the electronic still camera system sets the desired brightness by the user, the brightness can be obtained by setting with the automatic selection mode. The bright display parts 71R, 71G and 71B and start aperture value display part 72 and the aperture value modification distance display part 73 showing the brightness of the automatic selection mode display parts 71R, G and B are contained in this set display region 61.

[0053] The mode display part 74 is also contained in the set display region 61. The mode display part 74 shows if any of these mode is set, the endless mode or the limited mode. When the memory is empty in the frame memory 28 of the control device 20, the endless mode is the mode where the stored data is eliminated, the photographing is continued by storing the new data on the eliminated memory. The limited mode is the photographing mode where data is stored in the frame memory 28 of the control device 20. When the frame number obtained by photographing, it is the mode when the photographing is stopped. The frame number display part 75 displaying the photographing frame in the limited mode is contained in the set display region 61.

[0054] In addition, the single shutter display part 76 showing a single copy, the continuous shutter display part 77 showing a series of copies and the transport display part 78 are contained in the set display region 61, the transport display part displays and transports the image data in the computer device 40, the image data are stored in the frame memory 28 and contained in the control device 20.

[0055] For the case of the photographing of the object is repeated when the endless mode is set, figure 3 shows the state of the photographed object displayed in the image data stored in the frame memory 28 contained in the control device 20.

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[0056] The frame memory 28 becomes empty in the initial stage of the action. The frame memory 28 stores the image data of the photographed object of 8 frames, it is stored in sequence in the frame memory 28 for each photographs. The image data showing the photographed object obtained by photographing once is stored in one memory. The image data showing the photographed object obtained by photographing twice is stored in two memories. Thus, when an object is photographed 8 times, they are stored in sequence from 1 frame to 8 frames according to the photographing. When the photographing of the 8th photographing is completed, the empty memory in the frame memory becomes full. Therefore, the image data stored with old photographs and the image data stored in one frame memory are deleted. The image data obtained by photographing 9 times are stored in the one frame memory. When the photographing is continued further, the image data obtained by taking new pictures are stored in the deleted memory. Thus, when the photographing is continued, the empty memory in frame memory 28 becomes full, the image data obtained by the new pictures are stored in the frame memory.

[0057] Figure 4 shows the state of the photographed object displayed by the image data stored in the frame memory 28 that is contained in the control device 20 and for the case where the photographing of the object is repeated when the limited mode is set.

[0058] The frame memory 28 in the limited mode becomes empty in the initial stage of the action. The frame memory 28 stores the image data of the photographed object of 8 frames, it is stored in sequence in the frame memory 28 for each photographs. The image data showing the photographed object obtained by photographing once is stored in one memory. The image data showing the photographed object obtained by photographing twice is stored in two memories.

Thus, when an object is photographed 8 times, they are stored in sequence from 1 frame to 8 frames according to the photographing. When the photographing of the 8th photographing is completed, the empty memory in the frame memory becomes full, the photographing is stopped. The erroneous deletion of the image data obtained by photographing in the limited mode can be prevented.

[0059] Figure 5 shows the state where the condensed image of the photographed object displayed on the preview screen display region 60 which displays the image data stored in the frame memory 28 of the control device 20. The image data stored in the frame memory 28 that are controlled in CPU29 of the control device 20 are inserted and read out in the preview screen display region 60. The condensed image of the image displayed by the image data stored in the frame memory is displayed by providing to the computer device 40.

[0060] In the example shown in figure 5, the image data of 8 frames are stored in the frame memory 28 and the memory becomes full. The condensed image of the image displayed by the image data stored in the one frame memory stored in the frame memory 28 are displayed in the 1st display region PR1. The condensed image of the image displayed by the image data stored from the 2nd frame to the 8th frame memory stored in the frame memory 28 are displayed from the 2nd display region PR2 to the 8th display region PR8.

[0061] In the example shown in figure 5, the mode display part 74 displays the setting of the limited mode (shown in black round arrows), photographing above this is stopped. When the endless mode is set, the image data having the maximum storage time is deleted and the new image data obtained from photographing is stored in the deleted memory. The condensed image of the image displayed by the newly stored image data are displayed in the display region corresponding to the preview screen display region 60.

[0062] The user of the electronic still camera system selects the desired images viewing the condensed image data displayed in the preview screen display region 60. Only the image data showing the selected images can be recorded and transported to the computer device 40, they are read out from the frame memory 28. The image selected by the user are displayed in the dark frame in the display regions PR1 - PR8. The 2nd display region PR2 is selected in the example shown in figure 5. The dark frame showing the selecting of the image can be moved by operating the cursor key contained in the input device 46 of the computer device 40, the desired images can be selected.

[0063] The user of the electronic still camera system selects the desired images with the dark frame, the transport display part 78 is set using the cursor key contained in the input device 46. If the execution key of the input device is pressed, the read command of the image data showing the images selected by the user is provided to the CPU 29 of the control device 20 outputted from the CPU42 of the computer device 40. CPU29 of the control device 20 answers to the read command coming from the computer device 40, the image data of the images corresponding to that command are read out from the frame memory 28 and are provided to the computer device 40. The image data are provided to the memory device 45 of the computer device 40 and recorded in the memory medium.

[0064] When the other images displayed in the image data recorded in the memory medium are the desired selected images, the transport command are provided to the control device 20 from the computer device 40. The image data responding to the transport command is provided to the computer device 40 from the control device 20 and the image data are recorded in the recording medium. The desired images are displayed in the preview screen display region 60, the delete command from the input device 46 of the computer device 40 is inputted and provided to the CPU29 of the control device 20. When the delete command is received by the CPU29 of the control device 20, the frame memory 28 is cleared. Thus, the limited mode is set and the photographing of the object is possible.

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[0065] Figures 6 and 7 are the flowcharts showing the action procedure of the CPU29 of the control device 20 when the endless mode or the limited mode is set.

[0066] While referring to figure 6, it is judged if the mode is set in the endless mode or the limited mode in the computer device 40 (step 111). If it is set in the endless mode, the photograph command from the computer device 40 becomes in the holding state (step 112).

[0067] When the photograph command from the computer device 40 is at (YES in step 112), the photograph control of the camera head 10 is performed (step 113) and the frame memory 28 is judged if it is empty (step 114).

[0068] If the frame memory 28 is empty (step 114 is YES), the image data obtained by photographing is stored in the memory (step 115). If the frame memory 28 is empty (NO for step 114), the image data that has been stored the longest in the frame memory 28 is deleted (step 116), the new image data obtained by photographing is stored in the memory where the image data has been deleted (step 117).

[0069] The image data stored in the frame memory 28 is provided to the computer device 40 after insertion and reading out (step 118). Thus, the condensed image of the image displayed in the image data stored in the frame memory 28 is displayed in the preview screen display region 60 of the computer device 40.

[0070] The desired image among the condensed images displayed in the preview screen display region 60 is selected by the user of the electronic still camera system, the transport command is provided (YES for step 119), the image data showing the image indicated by the user is transported to the computer device 40, it reads out from the frame memory 28 (step 120). The image data is provided to the recording device 40 of the computer device 40 and it is recorded in the recording medium.

[0071] When the limited mode is set, while referring to figure 7, the photographing command from the computer device 40 becomes in the holding state (step 121).

[0072] When the photographing command comes from the computer device 40 (YES for step 121), the frame memory 28 is judged if it is empty (step 122).

[0073] When the frame memory is not empty (No in step 122), the photographing stops (step 125), thus, the image data stored in the frame memory 28 is prevented from being deleted erroneously (step 125).

[0074] When the frame memory is empty (YES in step 122), the photographing of the object to be photographed is performed (step 123) and the photographing command is performed in the camera head 10. The image data obtained by photographing is stored in the set memory (step 124).

[0075] The image data stored in the frame memory 28 is provided to the insertion and read out computer device 40 (step 126). Thus, the condensed image displayed by the image data stored in the frame memory is displayed in the preview screen display region 60 of the computer device 40.

[0076] The desired image among the condensed images displayed in the preview screen display region 60 is selected by the user of the electronic still camera system, the transport command is provided (YES for step 127), the image data showing the image indicated by the user is transported to the computer device 40, it reads out from the frame memory 28 (step 128). The image data is provided to the recording device 40 of the computer device 40 and it is recorded in the recording medium.

[0077] (2) The 2nd implementation example

The electronic camera system shown in figure 1 can be set to a desired brightness if a desired brightness is desired in the object to be photographed, the automatic select mode can be set.

[0078] When the automatic select mode is set, figure 8 shows an example of the display screen of the monitor 44 of the computer device 40. Figure 9 is the flowchart showing the process procedure of the CPU29 contained in the control device 20 when the automatic select mode is set.

[0079] When the cursor key contained in the input device 46 of the computer device 40 is operated, the automatic select display part

71 is displayed, when the execution key of the input device 46 is pressed, the automatic select mode is set (step 131). Next, the images are inputted with the desired brightness (step 132). The input of the brightness can be performed for the R, G and B by modifying the display of the set brightness display part 71R, 71G and 71B using the ten keys contained in the input device 46. For example, the average value of the R component of the image is set at 100 and the average value for the G component of the image is set at 100 and the average value of the B component is set at 100. The brightness is set at one part of the region of the object to be photographed, it is preferred that it is set for the whole region.

[0080] In addition, the display of the start aperture value display part 72 and the aperture value modification space display part 73 are set by the input device 46 (step 133).

[0081] When the setting of the steps 131, 132 and 133 are completed, the cursor in the input device 46 is moved to the continuous shutter display part 77, the execution key is pressed. Thus, the automatic select photograph command is provided to the CPU29 (step 134).

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[0082] When the automatic select photograph command is provided to the CPU29 of the control device 20 from the computer device 40, the aperture 13 of the camera head 10 is controlled like the aperture value displayed in the start aperture value display part 72. The aperture value is opened at the distance displayed in the aperture value modification distance display part 73 for each photograph of one frame, the photographing is performed (step 135). The continuous photographing in several frames can be recorded in the frame memory 28.

[0083] The image data obtained by photographing is stored in sequence in the frame memory 28 (step 136). The image data stored in the frame memory 28 is provided to the monitor 44 of the insertion and read out computer device 40. The condensed image of the images displayed by the image data recorded in the frame memory 28 is displayed in the preview screen display region 60 (step 137).

[0084] On the other hand, the average brightness of the image displayed by the image data stored in the frame memory 28 is calculated for each R, G and B (step 138). When the brightness is set for one part of the photographed object, the brightness in the region corresponding to one region is calculated for each R, G and B. The images having the brightness closest to the brightness set in the set brightness display parts 71R, 71G and 71B among the images displayed by the image data stored in the frame memory 28 are selected (step 139). When the setting of the brightness is only at one region of the photographed object, the image having the brightness in the region corresponding to that one region is selected. The frame display is performed in the condensed image of the selected images. Thus, whether the bright images are selected by the user can be verified.

[0085] Next, the cursor is moved to the transport display part 78, the execution key is judged if it is pressed. If the execution key is pressed (YES for step 140), the image data displaying the image that is selected automatically is provided to the computer device 40 read from the frame memory (step 143). The image data is recorded in the recording medium by the recording device 45.

[0086] When the automatically selected images is the desired image, the other images are judged if they are selected (step 141). When the other images are selected, the black frame of the preview display region 60 is moved to the desired condensed image by the cursor key and the cursor is moved to the transport display part 78 and the execution key is pressed. Thus, the image data showing the newly selected image is read from the frame memory 28 and transferred to the computer device 40 (step 143).

[0087] When the delete key of the input device 46 is pressed and if the desired image is not contained in the images displayed by the image data obtained from photographing, the image data stored in the frame memory 28 is deleted.

[0088] The aperture value is changed for each photographing, the image with desired brightness is obtained and the focus amount or the zoom amount are changed for each photographing and the image of a desired size or the image of a desired focus can be obtained.

[0089] (3) The 3rd implementation example

When the bright part and dark part are contained in the object to be photographed like inside the house and outside the house, the exposure in the dark part is combined with the bright part called the true white part and the exposure in the bright part is combined with the dark part which is called the true black part. In the electronic still camera system shown in figure 1, several frames of photographs are obtained by changing the exposure in the same object to be photographed. An image with correct brightness can be obtained by combining the part of the object photographed with the correct brightness, the setting of the exposed synthesis mode is possible.

[0090] During the setting of the exposure synthesis mode, figure 10 shows an example of the display screen of the monitor display device 44 of the computer device 40. Figure 11 shows an example of the exposure synthesis set screen of the monitor display device 44 in the computer device 40. Figure 12 is the flowchart showing the process sequence of the CPU29 of the control device 20 in the exposure synthesis mode.

[0091] When the photographing is performed in the exposure synthesis mode, first, the synthesis set image shown in figure 11 is displayed on the screen of the monitor display device 44 of the computer device 40. The synthesis set screen is display controlled by providing the synthesis set screen display command from the input device 46 of the computer device 40.

[0092] The exposure synthesis display region 80 and the focus synthesis display region 90 are contained in the synthesis set screen. The exposure synthesis display region 80 is the region showing the setting state in the exposure synthesis mode. The focus synthesis display region 90 is the region showing the setting state in the focus synthesis mode which will be discussed later.

[0093] The exposure synthesis mode display part 82 showing the setting of the exposure synthesis mode, the start aperture value display part 83 for displaying the first aperture value when the aperture value is changed when the exposure amount is changed, the diaphragm value modification space display part 84 showing the distance for modifying the aperture value, the frame number display part 85 showing the photographing frames with the modification of the exposure amount and the correction brightness display part 86 for displaying the brightness obtained in the images are contained in the exposure synthesis display region 80.

[0094] The focus synthesis display part 91 showing the setting of the focus synthesis mode, the start focus value display part 92 for showing the position of the first focus lens 11 when the position of the focus lens is changed for changing the focusing amount, the focus amount modification distance display part 93 for showing the movement distance of the focusing lens 11 and the frame number display part 94 for showing the frames for photographing when the focusing amount is changed are all contained in the focus synthesis display region 90.

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[0095] Referring to figure 12, when the photographing is performed in the exposure synthesis mode, the synthesis set screen is displayed on the monitor display device 44, the exposure synthesis mode is set. The cursor key of the input device 46 is operated. The cursor is moved in the start aperture value display part 83 and the aperture value modification distance display part 84, the frame number display part 85 and the correction brightness display part 86. The start aperture value, the aperture value modification distance and the correction brightness are set respectively (step 151).

[0096] When the setting is completed, the cursor is returned to the basic screen shown in figure 10. The cursor is moved to the continuous shutter display part 77. By pressing the execution key, the photographing command is provided into the computer device 40 from the input device 46 and provided to the control device 20 from the computer device 40 (step 152). When the photographing command is provided to the CPU29 of the control device 20, the aperture value is displayed in the start aperture display part 83, the aperture 13 is controlled. The number of frame displayed in the frame number display part 85 is photographed (step 153) by the camera head 10 at the distance of the aperture value displayed in the aperture value modification distance display part 84.

[0097] The image data obtained from photographing is provided and recorded in sequence in the frame memory 28 (step 154). The image data stored in the frame memory 28 is read out. The edge detection process is performed, the image data are divided into bright and dark regions among the images displayed (step 155). The image data of several images divided into the bright region and dark region are transferred to the computer device 40. The condensed images are displayed in the preview screen display region 60, this state is shown in figure 10. The brightness and darkness of the interior room image region 102 are displayed with a close hatching, the closer the hatching, the darker is that part, the wider the hatching, the brighter is that part.

[0098] Among the images divided into the bright region and dark region, the region of one image is obtained by combining at the region close to the proper brightness displayed in the synthesis set screen, the respective region is selected from the bright region and the dark region (step 156).

[0099] If selected, the bright region and the dark region are synthesized into one image (step 157). The image data showing this synthesis image is transferred to the computer device 40 from the control device 20 (step 158).

[0100] When the image data showing the synthesis image is transferred to the computer device 40, the monitor display device 44 shown in figure 11 becomes the synthesis set screen, the synthesis image 100 is displayed in the bottom half of the screen in the monitor display device 44. This image synthesis image 100 is made of the region 101 showing the outside of the house and region 102 showing the inside of the house, so the proper brightness can be set by the operator.

[0101] Therefore, when the object consisting of a bright part and dark part is photographed, the image having a suitable brightness is obtained, the so-called white and black can be prevented.

[0102] (4) The 4th implementation example

For far object and close object to be photographed, when the focal point for close object is obtained but the focal point for far object cannot be obtained and when the focal point for far object is obtained, the focal for far object cannot be obtained. When there is far object and close object in the picture to be taken, the focal point for both objects cannot be obtained. For the case of the far object and close object in the picture to be photographed using the electronic still camera system shown in figure 1, the image can be obtained with the focal point of both objects matched. The focus synthesis mode can be set.

[0103] Figure 13 shows an example of the display screen of the monitor 44 of the computer device 40 during the setting of the focus synthesis mode. Figure 14 shows an example of the focus synthesis set screen of the monitor 44 in the computer device 40. Figure 15 is the flowchart showing the process procedure of the CPU 29 of the control device 20 in the focus synthesis mode.

[0104] Referring to figure 15, when the photographing is performed in the exposure synthesis mode, the synthesis set screen is displayed on the monitor display device 44, the exposure synthesis mode is set. The cursor key of the input device 46 is operated. The cursor is moved in the start focus value display part 92, the focus modification distance display part 94 and the frame number display part 94. The start focus value, the focus modification distance and the photographing frame are set respectively (step 161).

[0105] When the set is completed, the focus lens 11 of the camera head 10 is controlled (step 162) to match the point in the object at the position that is the furthest among the objects.

[0106] When the control of the focus lens 11 is completed, the process returns to the basic screen shown in figure 13. The cursor moves to the continuous shutter display part 77. By pushing the execution key, the photograph command is provided to the computer device 40 from the input device 46 (step 163). If the photograph command is provided to the CPU of the control device 20, the frame number displayed in the frame number display part 94 is photographed (step 164) at the distance displayed in the focus modification distance display part 93.

[0107] The image data obtained from the photographing is provided to the sequence frame memory 28 and is recorded (step 165). The image data stored in the frame memory 28 is read, the condensed image of the image displayed by the image data stored in the frame memory 28 transferred to the computer device 40 is displayed in the preview screen (step 166), This state is shown in figure 13. In figure 13, wide hatching is displayed for the focusing of the object to be photographed.

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[0108] Also, when a focusing part exists in the images displayed by the image data stored in the frame memory 28 ,the object to be photographed is selected (step 167). The focused part of the selected images is extracted, the image data is extracted (step 168).

[0109] 1 image is produced from the images displayed in the extracted image data (step 169). The image data obtained from these produced images are sent to the computer device 40 from the control device 20 (step 170).

[0110] When the image data showing the produced images are transported to the computer device 40, monitor 44 becomes the produced set images, the produced image 100 is displayed in the lower half region of the screen monitor 44. This produced image 100 is the focus of any of the objects 103 and 104 that exist in the produced image.

[Brief explanation of the diagrams]

[Figure 1] This block diagram shows the electronic configuration of the electronic still camera system.

[Figure 2] This shows an example of the display screen of the monitor display device connected to the computer device.

[Figure 3] This shows the relationship of the memory contents of the picture and frame memory when the endless mode is set.

[Figure 4] This shows the relationship of the picture and the memory contents of the frame memory when the limited mode is set.

[Figure 5] This shows an example of the display screen of the monitor display device connected to the computer device.

[Figure 6] This is the flowchart showing the process procedure of the endless mode.

[Figure 7] This is the flowchart showing the process procedure of the limited mode.

[Figure 8] This shows an example of the display screen of the monitor display device connected to the computer device.

[Figure 9] This is a flowchart showing the process procedure of the automatic selection mode.

[Figure 10] This shows an example of the display screen of the monitor display device connected to the computer device.

[Figure 11] This shows the produced set images displayed in the monitor display device connected to the computer device.

[Figure 12] This is the flowchart showing the process procedure of the exposure synthesis mode.

[Figure 13] This shows an example of the display screen of the monitor display device connected to the computer device.

[Figure 14] This shows the produced set images displayed in the monitor display device connected to the computer device.

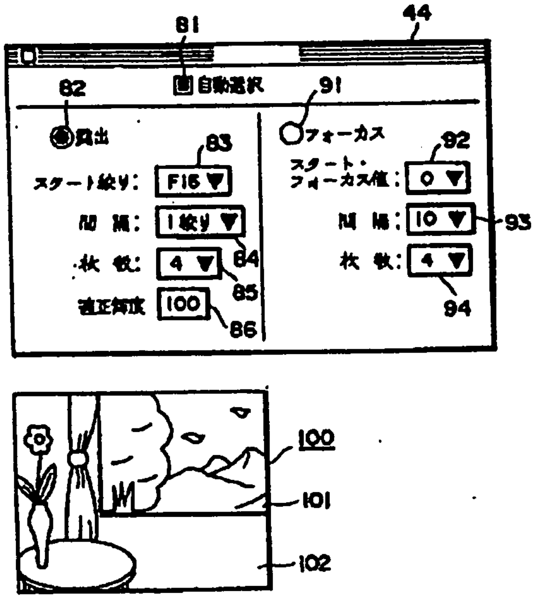
[Figure 15] This is a flowchart showing the process procedure of the focus synthesis mode.

[Description of the symbols]

10	camera head (photographing means)
20	control device
28	frame memory (memory means)
29	CPU (endless photographing mode control means, limited photographing mode control means, recording control means
40	computer device

46 input device

[Figure 11]


81
44
自動選択
82
91
露出
フォーカス
83
92
スタート絞り:
F16
スタート・フォーカス値:
0
間隔:
1絞り
間隔:
10
93
枚数:
4
84
枚数:
4
85
補正輝度
100
86
94
100
101
102

81 - automatic selection

82 - exposure

83 - start aperture

84 - space: 1 aperture

85 - number

86 - correction brightness

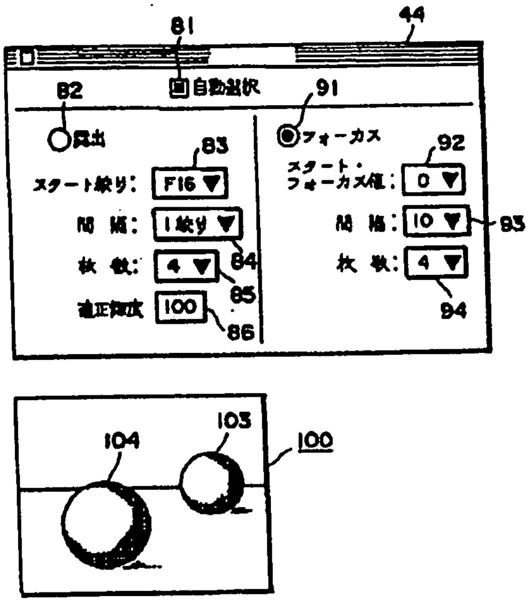
91 - focus

92 - start focus value

93 - space

94 - number

[Figure 14]


81
44
82
91
83
92
93
84
85
86
94
104
103
100

☑ 自動選択

○ 露出

スタート絞り: F16 ▼

間隔: 1絞り ▼

枚数: 4 ▼

適正輝度 100

● フォーカス

スタート・フォーカス値: 0 ▼

間隔: 10 ▼

枚数: 4 ▼

81 - automatic selection

82 - exposure

83 - start aperture

84 - space: 1 aperture

85 - number

86 - correction brightness

91 - focus

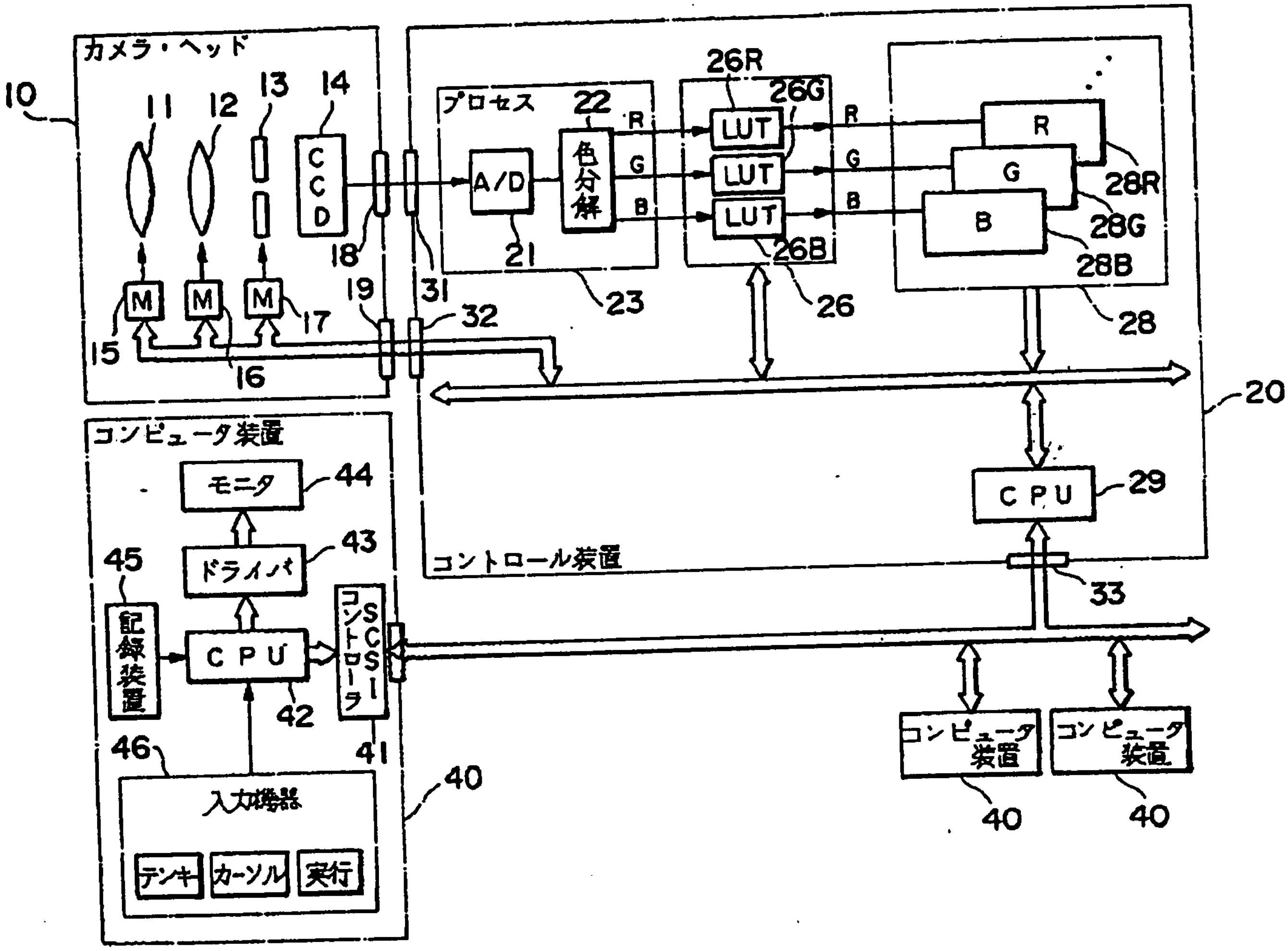
92 - start focus value

93 - space

94 - number

/13

[Figure 1]



カメラ・ヘッド
10
11
12
13
14
C C D
M
M
M
15
16
17
18
19
31
32
プロセス
22
色分解
A/D
21
23
R
G
B
26R
26G
LUT
LUT
LUT
26B
26
R
G
B
28R
28G
28B
28
20
C P U
29
コントロール装置
33
コンピュータ装置
モニタ
44
ドライバ
43
45
記録装置
C P U
42
SCSI
コントローラ
41
46
入力機器
テンキ
カーソル
実行
40
コンピュータ装置
40
コンピュータ装置
40

10 - Camera head

23 - process

22 - color decomposition

40 - computer device

44 - monitor

43 - driver

45 - recording device

41 - controller SCSI

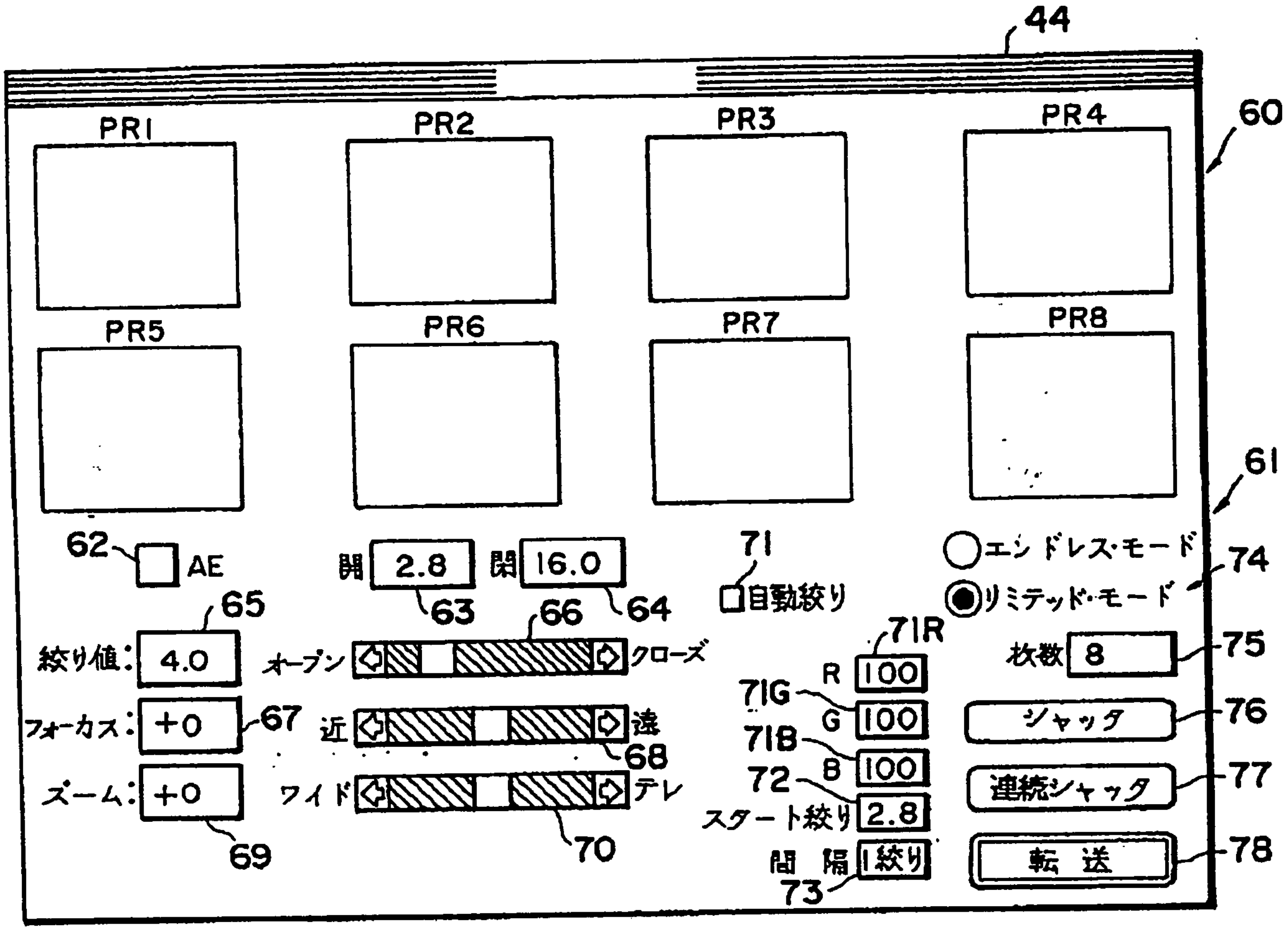
46 - input device-10 key cursor execution

20 - control device

40 - computer device

40 - computer device

[Figure 2]


44
60
61
PR1
PR2
PR3
PR4
PR5
PR6
PR7
PR8
62
☐ AE
開 2.8
閉 16.0
63
64
71
☐自動絞り
○エンドレス・モード
●リミテッド・モード
74
65
66
絞り値: 4.0
オープン
クローズ
71R
R 100
71G
G 100
71B
B 100
枚数 8
75
フォーカス: +0
67
近
遠
68
シャッタ
76
ズーム: +0
ワイド
テレ
72
スタート絞り 2.8
連続シャッタ
77
間隔 1絞り
73
転送
78
69
70

63 - open

64 - close

65 - aperture value

67 - focus

69 - zoom

66 - <..open - ..> close

68 - <..close - ..> far

70 - <..wide - ..>slim

71 - automatic aperture

72 - start aperture

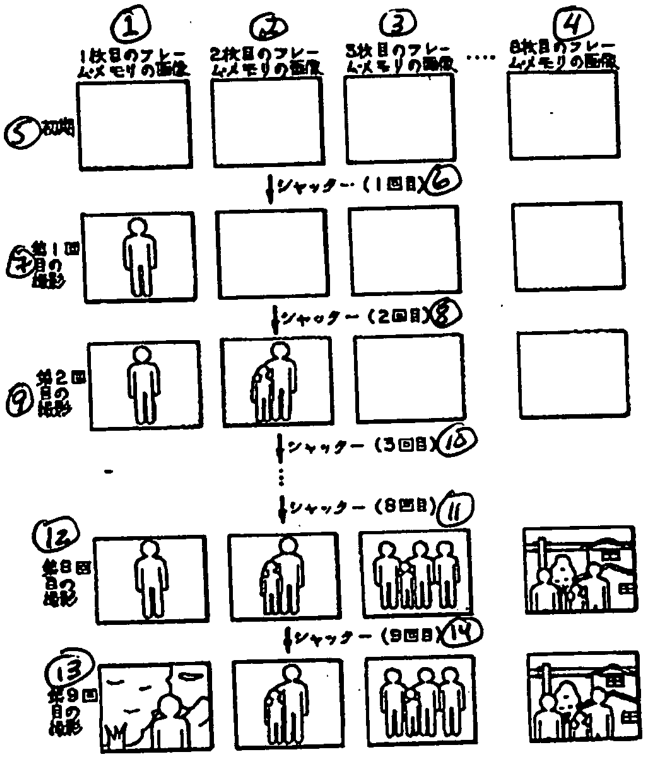
73 - space - 1 aperture

74 - 0 endless mode

. limited mode

75 - number, 76 - shutter, 77 - continuous shutter, 78 - transfer

[Figure 3]

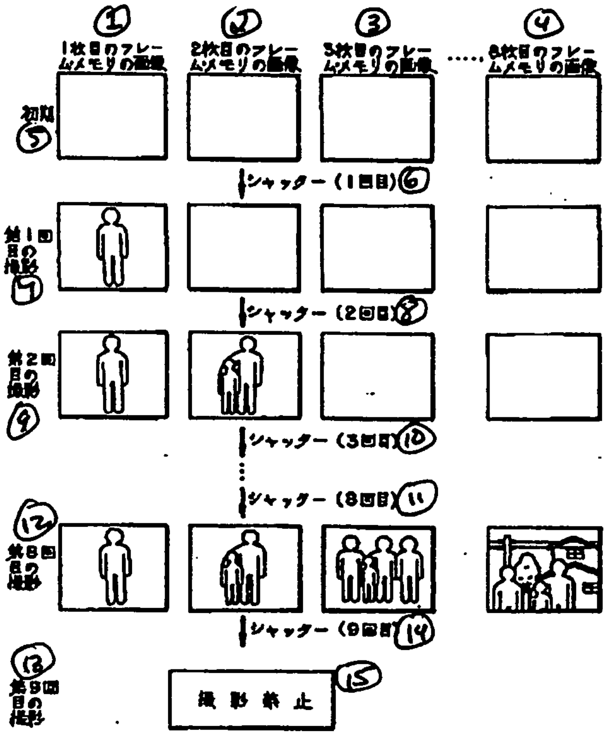

①
1枚目のフレームメモリの画像
②
2枚目のフレームメモリの画像
③
3枚目のフレームメモリの画像
....
④
8枚目のフレームメモリの画像
⑤ 初期
シャッター (1回目) ⑥
⑦ 第1回目の撮影
シャッター (2回目) ⑧
⑨ 第2回目の撮影
シャッター (3回目) ⑩
シャッター (8回目) ⑪
⑫ 第8回目の撮影
シャッター (9回目) ⑭
⑬ 第9回目の撮影

Keys:

1 - image of the 1st frame memory, 2 - image of the 2nd frame memory, 3 - image of the 3rd frame memory, 4 - image of the 8th frame memory, 5 - initial stage, 6 - shutter (the 1st), 7 - the 1st photograph, 8 - shutter (the 2nd), 9 - the 2nd photograph, 10 -

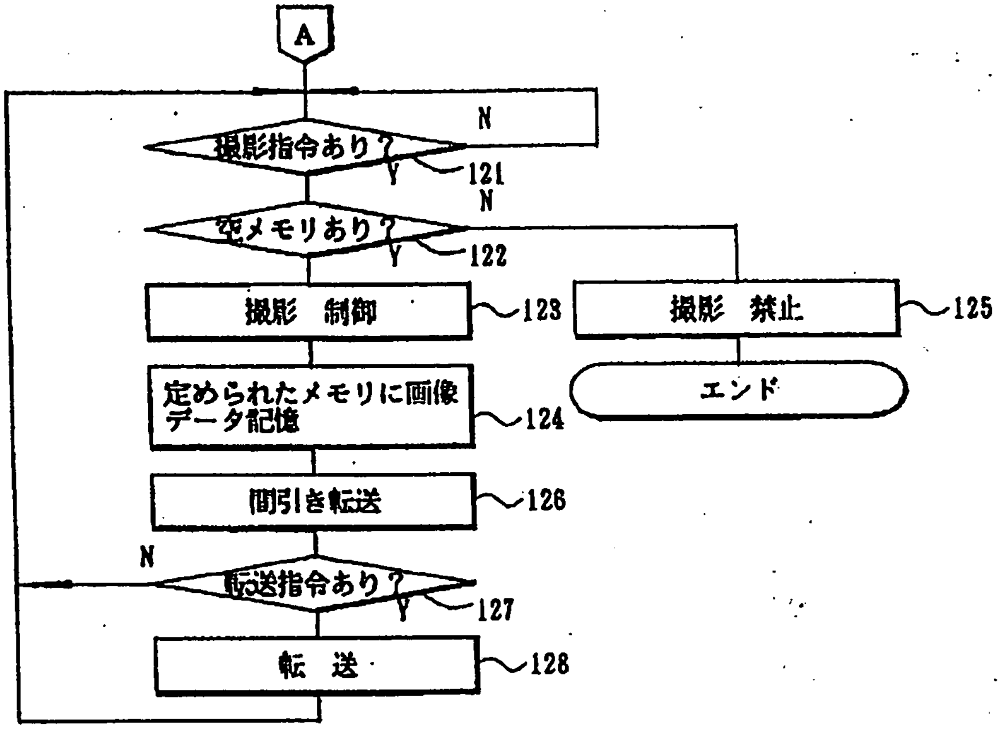
shutter (the 3rd), 11 - shutter (the 8th), 12 - the 8th photograph, 13 - the 9th photograph, 14 - shutter (the 9th)

[Figure 4]


①
1枚目のフレームメモリの画像
②
2枚目のフレームメモリの画像
③
3枚目のフレームメモリの画像
④
8枚目のフレームメモリの画像
初期
⑤
シャッター（1回目）
⑥
第1回目の撮影
⑦
シャッター（2回目）
⑧
第2回目の撮影
⑨
シャッター（3回目）
⑩
シャッター（8回目）
⑪
⑫
第8回目の撮影
シャッター（9回目）
⑭
⑬
第9回目の撮影
撮影禁止
⑮

1 - image of the 1st frame memory, 2 - image of the 2nd frame memory, 3 - image of the 3rd frame memory, 4 - image of the 8th frame memory, 5 - initial stage, 6 - shutter (the 1st), 7 - the 1st photograph, 8 - shutter (the 2nd), 9 - the 2nd photograph, 10 - shutter (the 3rd), 11 - shutter (the 8th), 12 - the 8th photograph, 13 - the 9th photograph, 14 - shutter (the 9th), 15 - photographing stops

[Figure 7]


A
撮影指令あり？
N
Y
121
空メモリあり？
N
Y
122
撮影 制御
123
撮影 禁止
125
エンド
定められたメモリに画像データ記憶
124
間引き転送
126
N
転送指令あり？
Y
127
転 送
128

121 - is there a photographing command ?

122 - is the memory empty ?

123 - photograph control

124 - the image data memory in the set memory

126 - insertion transfer

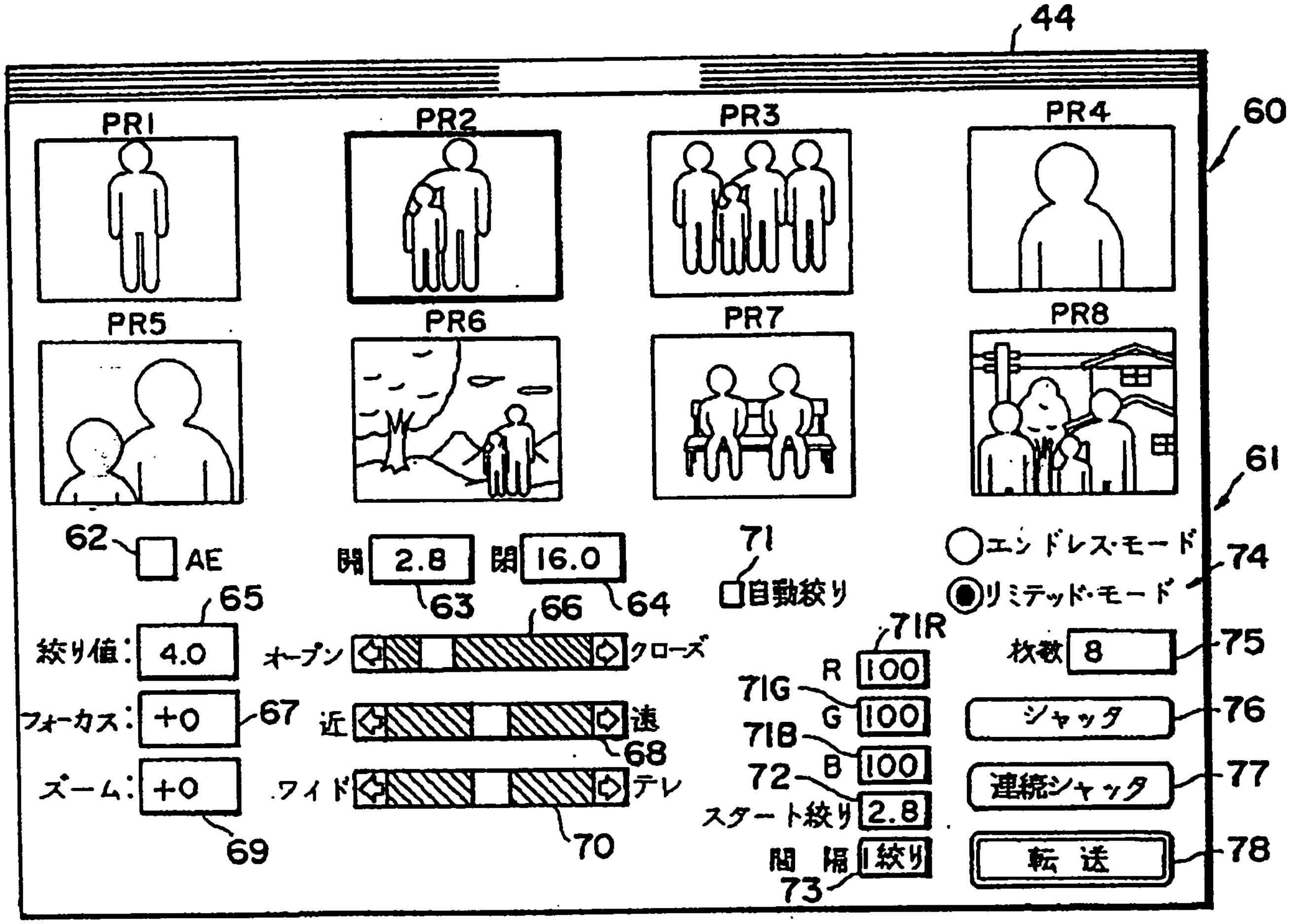
127 - is there a transfer command ?

128 - transfer

125 - photograph stop

END

[Figure 5]



44
60
61
PR1
PR2
PR3
PR4
PR5
PR6
PR7
PR8
62
☐ AE
開 2.8
閉 16.0
63
64
71
□自動絞り
○エンドレス・モード
●リミテッド・モード
74
65
66
絞り値: 4.0
オープン
クローズ
71R
R 100
71G
G 100
71B
B 100
72
スタート絞り 2.8
間隔 1絞り
73
枚数 8
75
シャッタ
76
連続シャッタ
77
転送
78
フォーカス: +0
67
近
遠
68
ズーム: +0
69
ワイド
テレ
70

63 - open

64 - close

65 - aperture value

67 - focus

69 - zoom

66 - <..open - ..> close

68 - <..close - ..> far

70 - <..wide - ..>slim

71 - automatic aperture

72 - start aperture

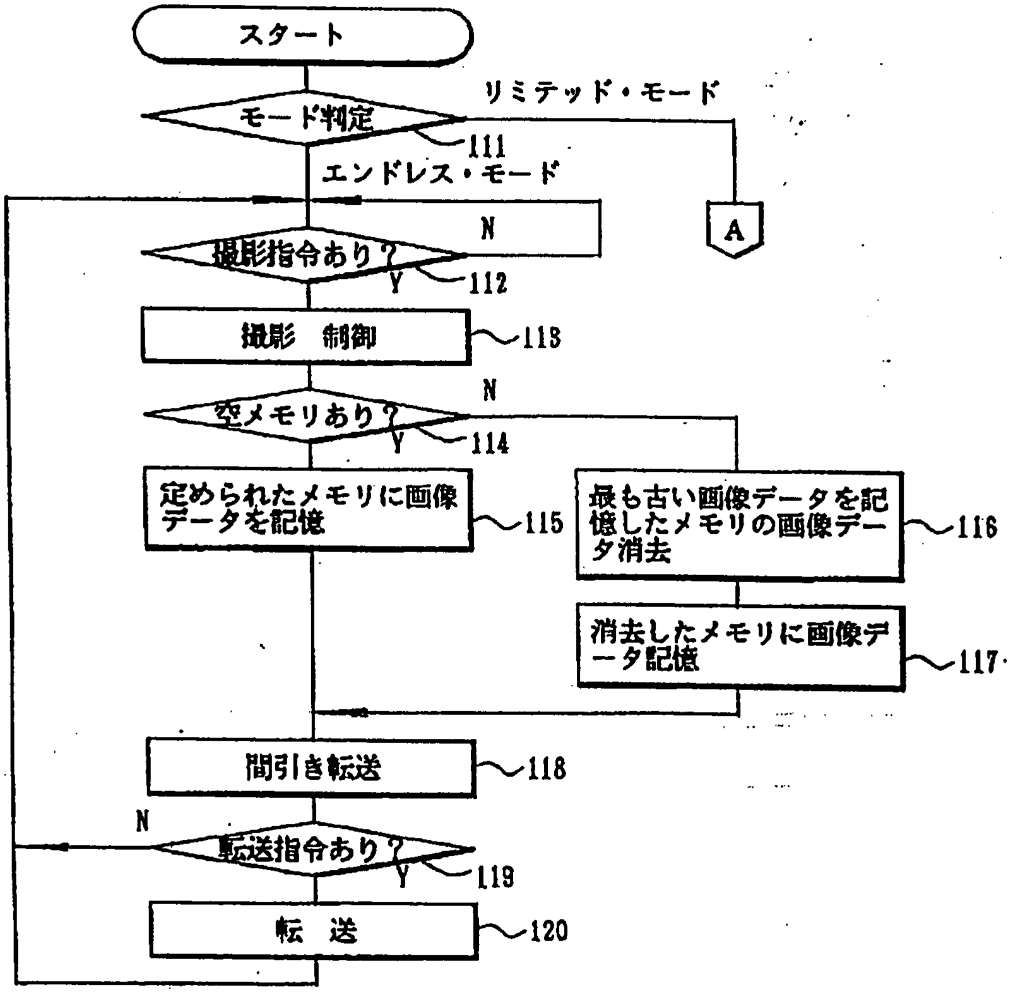
73 - space - 1 aperture

74 - 0 endless mode

. limited mode

75 - number, 76 - shutter, 77 - continuous shutter, 78 - transfer

[Figure 6]



スタート
モード判定
リミテッド・モード
111
エンドレス・モード
A
N
撮影指令あり？
Y
112
撮影　制御
113
N
空メモリあり？
Y
114
定められたメモリに画像データを記憶
115
最も古い画像データを記憶したメモリの画像データ消去
116
消去したメモリに画像データ記憶
117
間引き転送
118
N
転送指令あり？
Y
119
転　送
120

START

111 - mode judgement

A - limited mode

Endless mode

112 - photograph command ?

113 - photograph control

114 - is the memory empty ?

115 - the image data is stored in the set memory

116 - the old image data that is stored is deleted from the image data memory

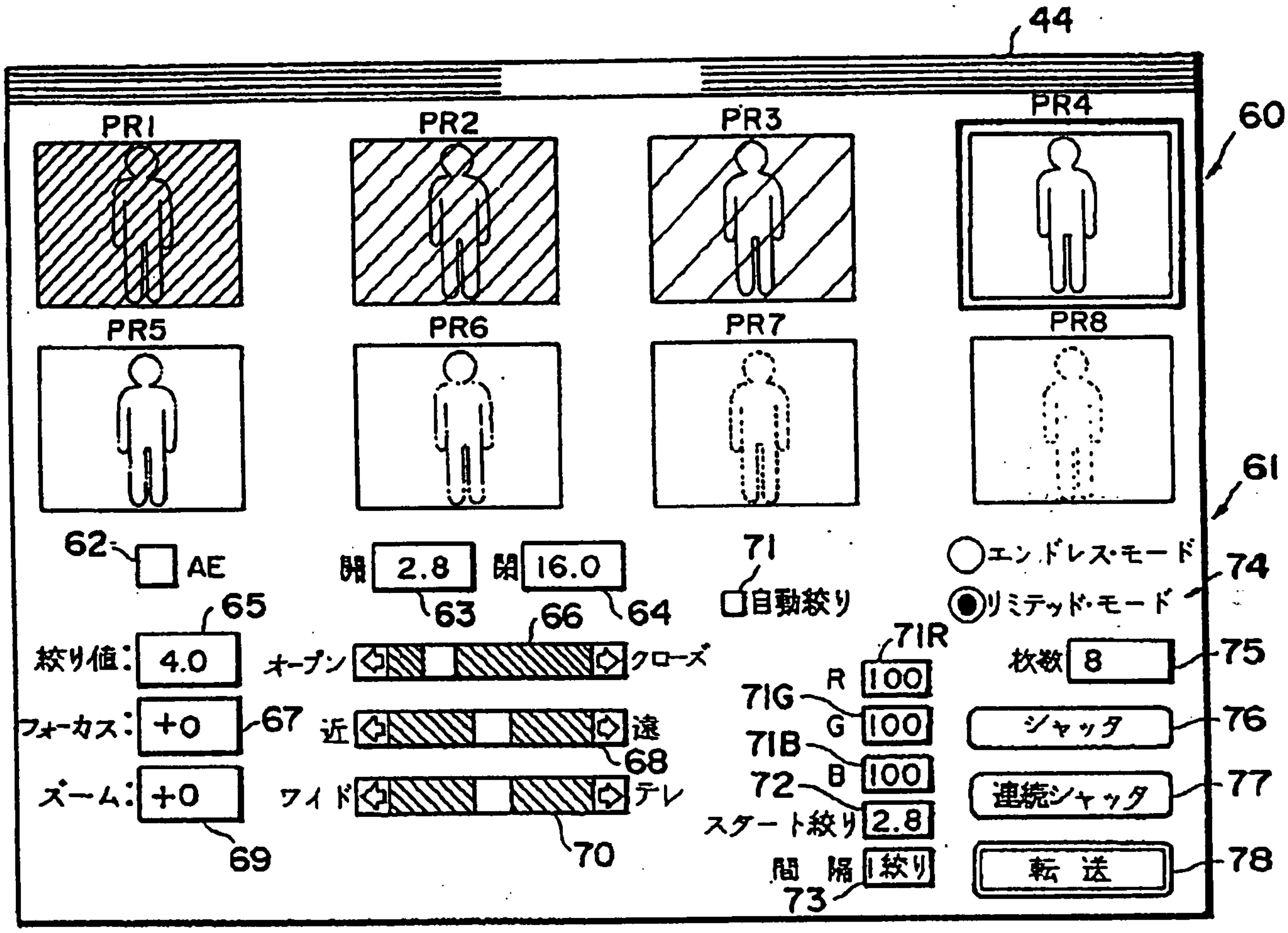
117 - stores the image data memory in the deleted memory

118 - insertion transfer

119 - transfer command?

120 - transfer

[Figure 8]


44
60
PR1
PR2
PR3
PR4
PR5
PR6
PR7
PR8
61
62
☐ AE
開 2.8
63
閉 16.0
64
71
□自動絞り
○エンドレス・モード
●リミテッド・モード
74
65
絞り値: 4.0
66
オープン
クローズ
71R
R 100
71G
G 100
71B
B 100
枚数 8
75
フォーカス: +0
67
近
遠
68
シャッタ
76
ズーム: +0
ワイド
テレ
72
スタート絞り 2.8
連続シャッタ
77
69
70
間隔 1絞り
73
転送
78

63 - open

64 - close

65 - aperture value

67 - focus

69 - zoom

66 - <..open - ..> close

68 - <..close - ..> far

70 - <..wide - ..>slim

71 - automatic aperture

72 - start aperture

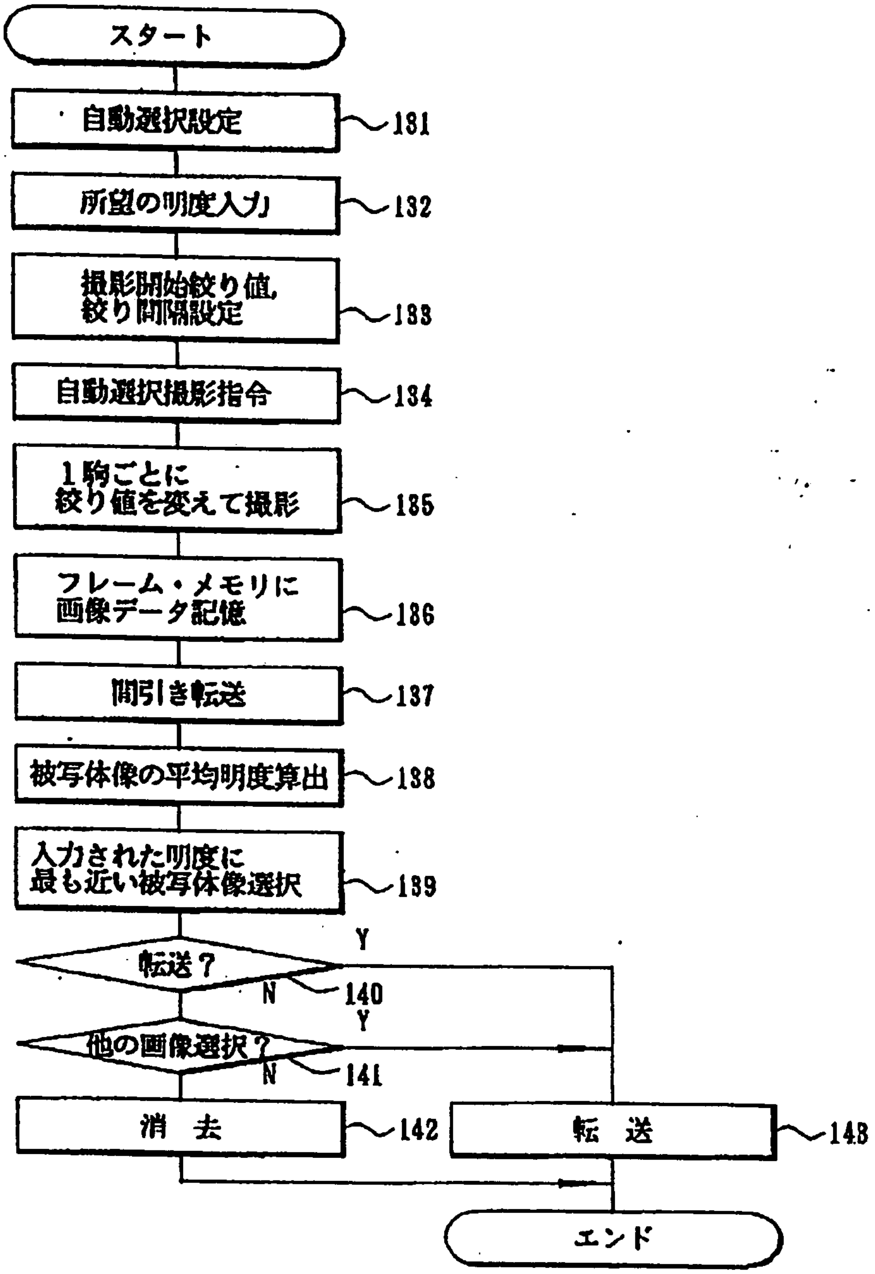
73 - space - 1 aperture

74 - 0 endless mode

. limited mode

75 - number, 76 - shutter, 77 - continuous shutter, 78 - transfer

[Figure 9]


スタート
自動選択設定
131
所望の明度入力
132
撮影開始絞り値,
絞り間隔設定
133
自動選択撮影指令
134
1駒ごとに
絞り値を変えて撮影
135
フレーム・メモリに
画像データ記憶
136
間引き転送
137
被写体像の平均明度算出
138
入力された明度に
最も近い被写体像選択
139
転送？
Y
N
140
他の画像選択？
Y
N
141
消 去
142
転 送
143
エンド

START

131 - automatic selection set

132 - the desired bright input

133 - the photograph start aperture value, the aperture distance set

134 - automatic selection photograph command

135 - the photographing with the change in the aperture value per frame

136 - store the image data memory in the frame memory

137 - insertion transfer

138 - average bright computation of the object to be photographed

139 - the object having the brightness closest to the inputted brightness is selected

140 - transfer ?

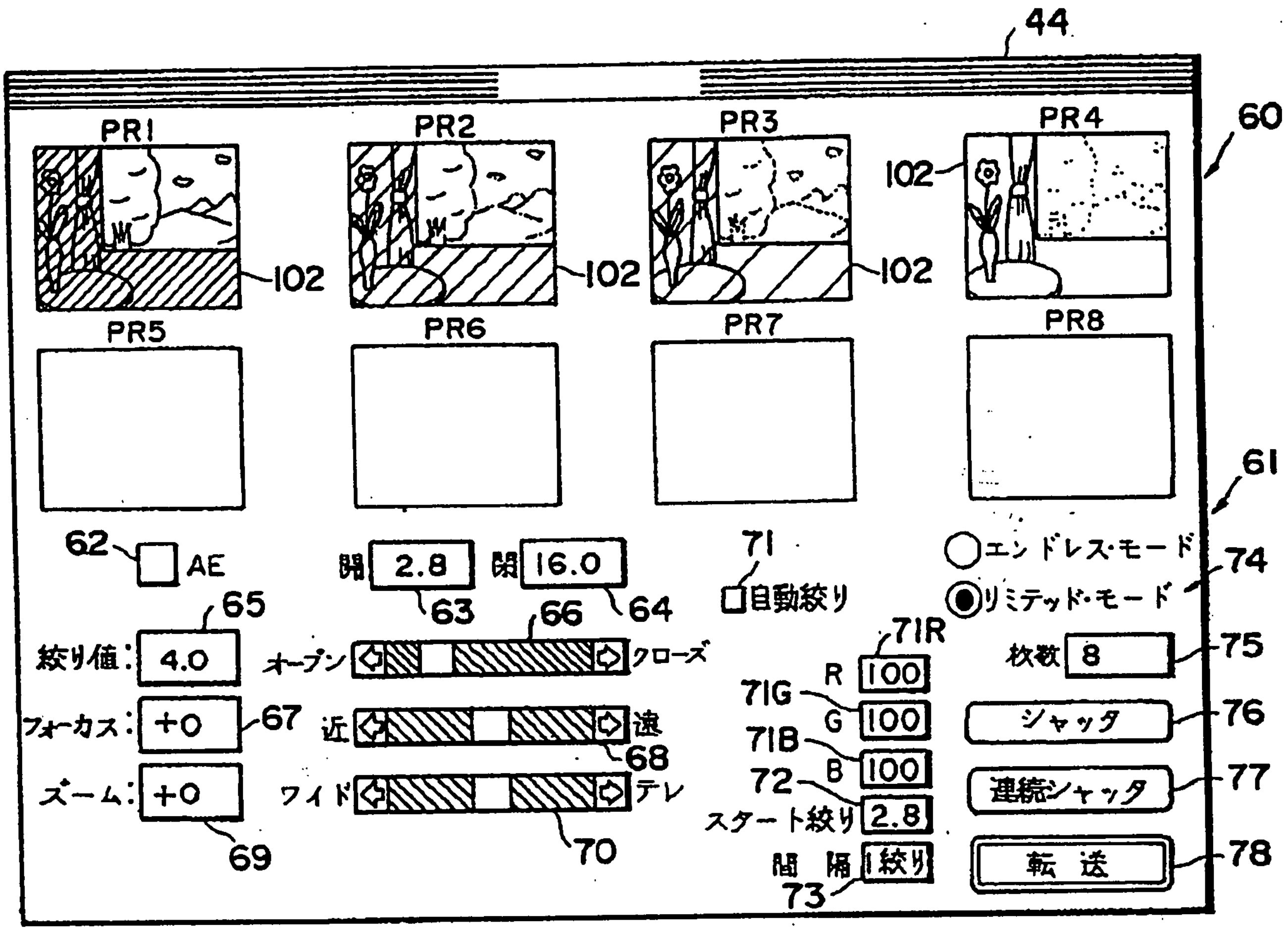
141 - other image selection?

142 - delete

143 - transfer

END

[Figure 10]


44
60
PR1
PR2
PR3
PR4
102
PR5
PR6
PR7
PR8
61
62
AE
開 2.8
閉 16.0
63
64
71
□自動絞り
○エンドレス・モード
●リミテッド・モード
74
65
66
71R
絞り値: 4.0
オープン
クローズ
R 100
枚数 8
75
フォーカス: +0
67
近
遠
71G
G 100
シャッタ
76
68
71B
B 100
ズーム: +0
ワイド
テレ
72
連続シャッタ
77
スタート絞り 2.8
間隔 1絞り
転送
78
69
70
73

63 - open

64 - close

65 - aperture value

67 - focus

69 - zoom

66 - <..open - ..> close

68 - <..close - ..> far

70 - <..wide - ..>slim

71 - automatic aperture

72 - start aperture

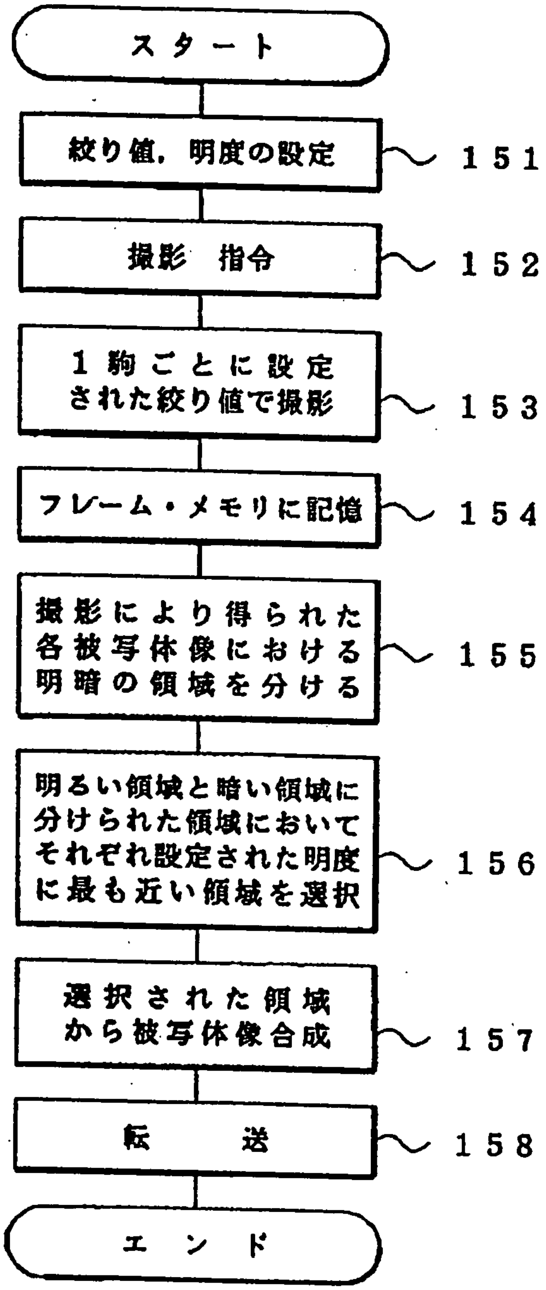
73 - distance - 1 aperture

74 - 0 endless mode

. limited mode

75 - number, 76 - shutter, 77 - continuous shutter, 78 - transfer

[Figure 12]


スタート
絞り値，明度の設定
151
撮影　指令
152
1駒ごとに設定された絞り値で撮影
153
フレーム・メモリに記憶
154
撮影により得られた各被写体像における明暗の領域を分ける
155
明るい領域と暗い領域に分けられた領域においてそれぞれ設定された明度に最も近い領域を選択
156
選択された領域から被写体像合成
157
転　送
158
エンド

START

151 - the setting of the aperture value and the brightness

152 - photograph command

153 - photograph with aperture value set for each frame

154 - store in the frame memory

155 - the bright region in the photographed object is divided

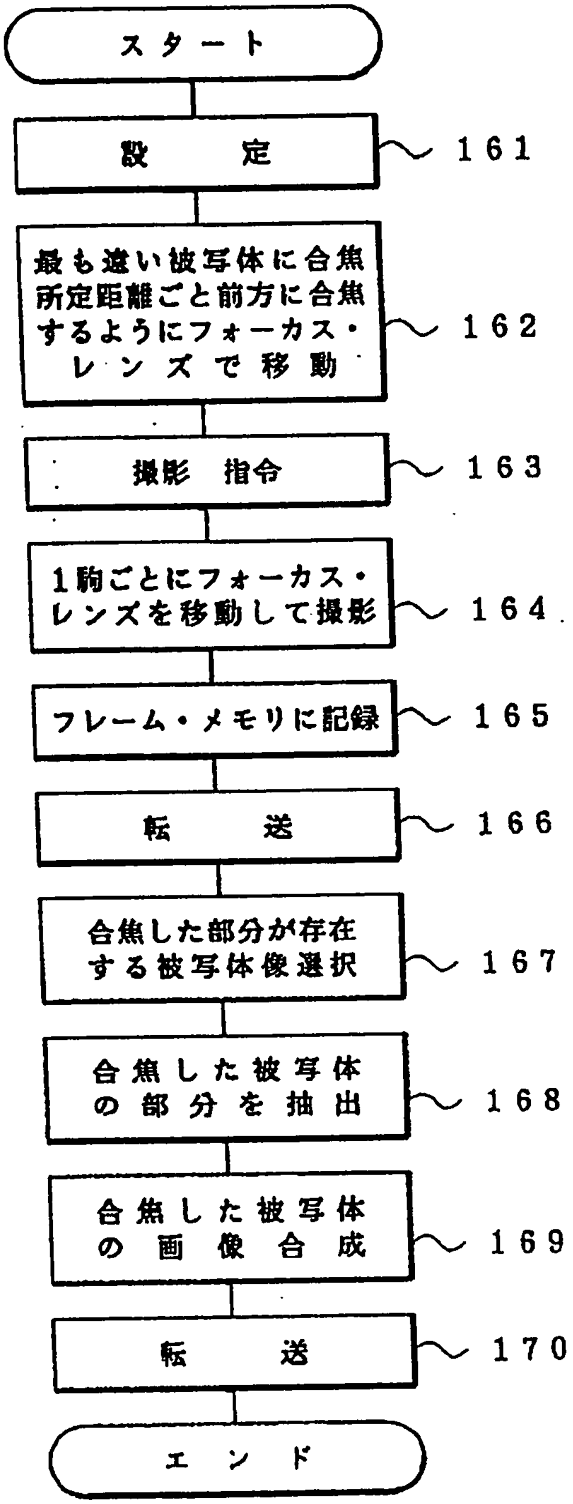
156 - the region is divided into the bright region and the dark region, the region having brightness closest to the respective setting is selected

157 - the object to be photographed is obtained from the selected region

158 - transfer

END

[Figure 15]


スタート
設定
161
最も遠い被写体に合焦
所定距離ごと前方に合焦
するようにフォーカス・
レンズで移動
162
撮影指令
163
1駒ごとにフォーカス・
レンズを移動して撮影
164
フレーム・メモリに記録
165
転送
166
合焦した部分が存在
する被写体像選択
167
合焦した被写体
の部分を抽出
168
合焦した被写体
の画像合成
169
転送
170
エンド

161 - set

162 - the focus lens is moved so as to focus in a certain focusing

distance from the furthest object to be photographed

163 - photograph command

164 - the photographing is performed by moving the focusing lens for every frame

165 - store in the frame memory

166 - transfer

167 - the object to be photographed that has the focused part is selected

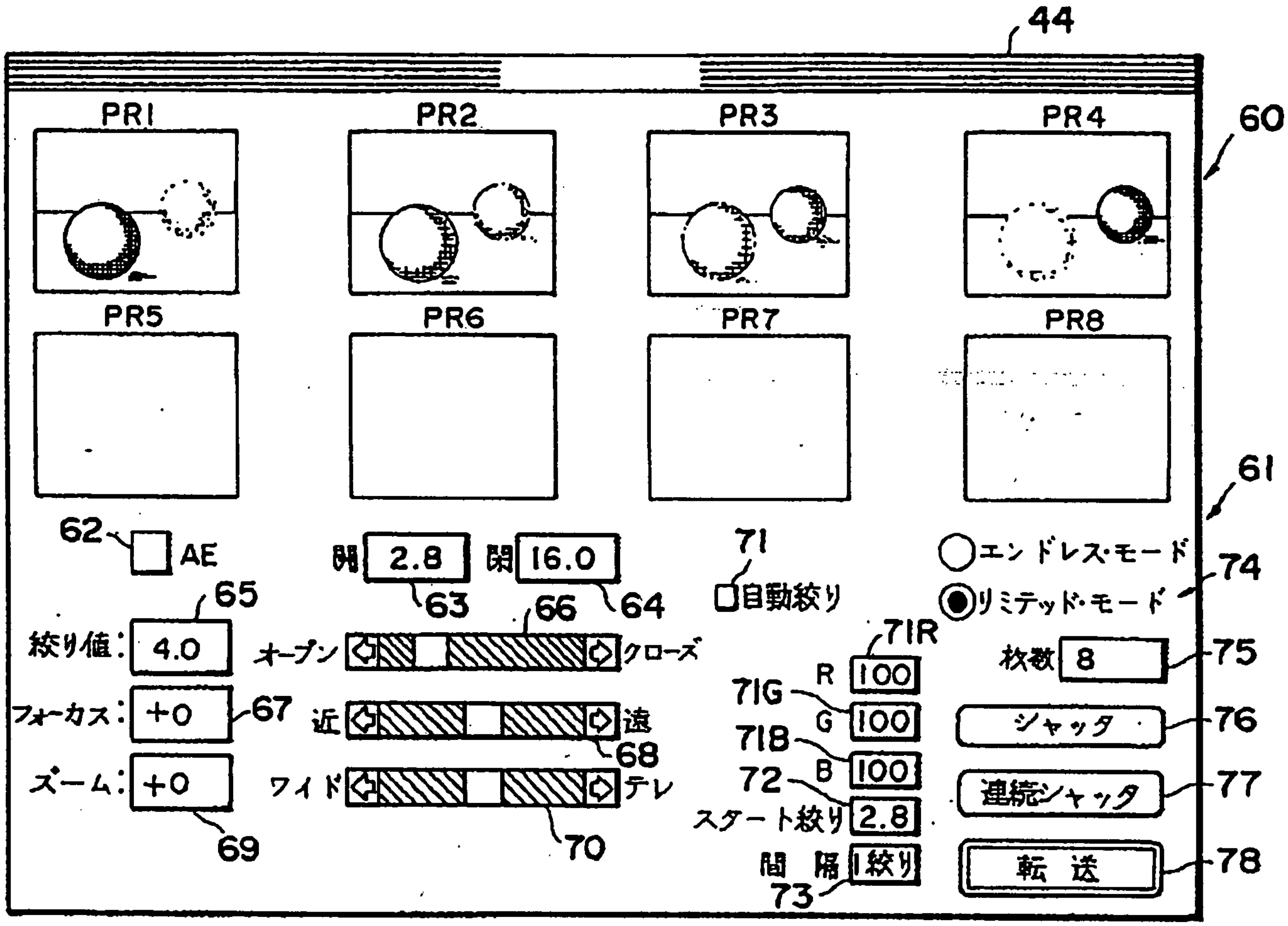
168 - the part where the object is focused is extracted

169 - image synthesis of the focused object

170 - transfer

END

[Figure 13]


44
60
61
PR1
PR2
PR3
PR4
PR5
PR6
PR7
PR8
62
AE
開 2.8
閉 16.0
63
64
71
□自動絞り
○エンドレス・モード
●リミテッド・モード
74
65
66
絞り値: 4.0
オープン
クローズ
71R
R 100
71G
G 100
71B
B 100
72
スタート絞り 2.8
間隔 1絞り
73
枚数 8
75
シャッタ
76
連続シャッタ
77
転送
78
フォーカス: +0
67
近
遠
68
ズーム: +0
ワイド
テレ
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70

63 - open

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65 - aperture value

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69 - zoom

66 - <..open - ..> close

68 - <..close - ..> far

70 - <..wide - ..>slim

71 - automatic aperture

72 - start aperture

73 - distance - 1 aperture

74 - 0 endless mode

. limited mode

75 - number, 76 - shutter, 77 - continuous shutter, 78 - transfer